

AMENDMENT**Listing of the Claims**

30. (Previously Presented) An instrument for use in monitoring a nucleic acid amplification reaction comprising multiple thermal cycles, comprising:

(a) a thermal cycler capable of alternately heating and cooling, and adapted to receive, at least one reaction vessel containing an amplification reaction mixture comprising a target nucleic acid, reagents for nucleic acid amplification, and a detectable nucleic acid binding agent; and

(b) a detector operable to detect a fluorescence optical signal while the amplification reaction is in progress and without opening the at least one reaction vessel, which fluorescence optical signal is related to the amount of amplified nucleic acid in the reaction vessel.

31. (Previously Presented) The instrument of claim 30, wherein the thermal cycler is adapted to receive a plurality of reaction vessels, each containing an amplification reaction mixture.

35. (Previously Presented) The instrument of claim 30, wherein the detector is operable to detect a fluorescence optical signal at a wavelength at or about 570 nm.

36. (Previously Presented) The instrument of claim 30, which includes a sealed transmission path between the reaction vessel and the detector.

37. (Previously Presented) The instrument of claim 36, wherein the sealed light transmission path is a fiber optic cable.

38. Canceled.

39. (Previously Presented) A system for use in monitoring a nucleic acid amplification reaction comprising multiple thermal cycles, comprising:

- (a) at least one reaction vessel adapted to contain an amplification reaction mixture comprising a target nucleic acid, reagents for nucleic acid amplification, and a detectable nucleic acid binding agent;
- (b) a thermal cycler capable of alternately heating and cooling such a reaction vessel, and
- (c) a detector operable to detect a fluorescence optical signal while the amplification reaction is in progress and without opening the at least one reaction vessel, which fluorescence optical signal is related to the amount of amplified nucleic acid in the reaction vessel.

40. (Previously Presented) The system of claim 39, wherein the system comprises a plurality of reaction vessels, each adapted to contain an amplification reaction mixture.

44. (Previously Presented) The system of claim 39, wherein the detector is operable to detect a fluorescence optical signal at a wavelength at or about 570 nm.

45. (Previously Presented) The system of claim 39, wherein the at least one reaction vessel includes a clear or translucent cap optically coupled to the detector by a sealed light transmission path.

46. (Previously Presented) The system of claim 45, wherein the sealed light transmission path is a fiber optic cable.

47. Canceled.